characters. He was successful in finding practically all the new combinations that were theoretically possible.

The Mendelian explanation runs as follows: The character of the hybrid zygote itself is maternal, as is to be expected from the cytological behavior during conjugation. The reduction division takes place during the first 2 nuclear divisions of the germinating zygote, but 3 of the resulting nuclei degenerate, so that the cells of the mature filament all have a common ancestor in the fourth nucleus; hence segregation appears in the first hybrid generation, but of course all of the cells of a given filament are alike. Such facts would furnish excellent support for our theoretical mechanism of inheritance, but the author could not be positive as to whether he was dealing with an F_1 or an F_2 generation. It is to be hoped that he will discover how to cultivate this material in the laboratory, and carry the work further under rigid experimental control.—MERLE C. COULTER.

Enzyme action.—VAN LAER[6] reports some observations on the nature of zymogens, which are claimed to confirm the results of FORD and GUTHRIE, who had shown that the increase of the amyloclastic activity of papaine with barley meal is not manifested when the infusion is kept in direct contact with the proteo-clastic ferments. The yeast infusions were obtained from yeast prepared according to the Lebedeff method. The addition of papaine to yeast juice destroyed the catalase and zymase. In the state of zymogens, there was shown greater stability and resistance to the factors of inactivation. The hefanal extract of yeast in the presence of antiseptics showed a measurable degree of inverting activity. This inverting agent was amylase. The diastase and papaine had no influence upon the hefanel infusion even after a 24 hours' digestion. Observation is made upon the intensity of autofermentation. After the latter there remains some amylase which is sensitive to papaine. This sensitiveness is expressed in the data as the decrease of the percentage of sugar inverted from 25.6 to 19 when papaine was added. Certain cellulary materials, as soluble or incoagulable protoplasmic products, decreased the activity of sucrase according to the concentration. In the presence of small quantities of these substances the rapidity of hydrolysis of saccharose is hardly modified. Extracts of yeast inactivated by acetone give a notable increase of inverting power when added to solution of papaine or active anylase, the yeast cells in this respect behaving like cellulary bodies. This increase is due on the one hand to the increase of sucrase, and on the other to the decrease of cellulary substance in the digestion products.—A. M. GURJAR.

Buried weed seeds.—Miss BRENCHLEY,[7] on the basis of considerable investigation, makes the following statement concerning the longevity of weed seeds in agricultural soils: "The changes in the proportion of arable and

[6] VAN LAER, HENRI, Zeits. für Gärungsphysiologie 6:169–175. 1918.

[7] BRENCHLEY, WINIFRED E., Buried weed seeds. Jour. Agric. Sci. 9:1–31. 1918.

grassland plants derived from buried seeds are so consistent and so regularly associated with the history of the land that one is irresistibly forced to the conclusion that when arable land is grassed over, a certain number of the seeds are able to retain their vitality for very many years. Many of the seeds die within a comparatively short time after burial, and as time goes on the number of living seeds gradually becomes less, although the evidence goes to show that some seeds will survive burial for at least 58 years. Usually most of the older arable seeds survive in the lower depths of soil where the conditions are less variable, whereas the shorter the time that land has been under grass the greater the proportion of arable seeds that are found near the surface. While the stock of arable seeds is diminishing with the lapse of time, the supply of grassland seeds is being augmented by fresh seeds that are ripened by the surface vegetation and are gradually carried down into the soil. Naturally enough, the greater number of these seeds are found in the upper inches of soil, comparatively few penetrating below the eighth inch."

Miss BRENCHLEY fails to note the much earlier and extensive work (1893–94) of PETER, which is very similar to hers in method and conclusion. She also fails to mention the well controlled work of BEAL and of DUVEL on the longevity of buried seeds, which likewise justifies her conclusions.[8]—WM. CROCKER.

Wound callus and bacterial tumor.—Polar difference in wound callus formation has often been observed in stems, and less frequently in root structure. MAGNUS[9] finds that segments of the root of a half long carrot with which he worked produced a wound callus on the morphologically apical face, but not on the basal face. This occurred whether the apical face was oriented upward or downward in the moist chamber. The callus starts at the cambium ring and spreads centripetally. When the apical face is infected with *Bacterium tumefaciens* the callus development is much greater. When the basal face is infected there is a considerable development of tumors on that face, and this acts in a correlative way to inhibit the normal tumor development in the apical face. MAGNUS also worked with a long fodder carrot. While infection in this form increased the callus development on the apical face of the segments tenfold, it induced very little tumor development on the basal face, and accordingly showed little correlative effect in inhibiting the normal development on the apical face.

MAGNUS offers evidence for the view that the tumor inducing organism in plants is not identical with that in man. He also suggests that certain conclusions of BLUMENTHAL and HIRSCHFIELD on the effect of *Diplococcus* in

[8] See CROCKER, WM., Mechanics of dormancy in seeds. Amer. Jour. Bot. 3:99–120. 1916.

[9] MAGNUS, WERNER, Wund-callus und Bakterien-Tumore. Ber. Deutsch. Bot. Gesells. 36:20–29. 1918.